FOREST HEALTH PROTECTION
Pacific Southwest Region
South Sierra Shared Service Area

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Service Visit to Inyo National Forest

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On August 3, 2005 we met with Scott Kusumoto and Tom Higley, Mammoth and Mono Lake Ranger Districts personnel, respectively, with the Inyo National Forest. Det Vogler, research scientist from Pacific Southwest Research Station, Institute of Forest Genetics in Placerville, accompanied us on the visit. Scott and Tom requested a service visit that incorporated a few different projects and some new areas that had questionable insect/disease problems. We visited several campgrounds during the day, as well as some private residences that were located nearby the district.

Casa Diablo Penny Pines Plantation

This Jeffrey pine plantation was established in the early 1980's, overstory removed a few years later, and has since been left to grow naturally. Trees vary in size and vigor, some growing tall with thick crowns, while others are short with thin crowns and clustered in groups. The site is fairly level, populated mainly with large Jeffrey pines and sagebrush. The ground cover is mostly comprised of mule ears, sagebrush, bitterbrush, and rabbit brush. There are a few single-leaf pinyon pines and junipers scattered among the Jeffrey pines. The soil is of volcanic origin, well-drained and dry.

About two years ago, Tom noticed mortality occurring in a large patch (about one acre in size) in the southeast corner of the plantation. Interestingly, all vegetation within the patch appears to be dying. The ground shows no indication of a past fire or any other disturbance that would affect all the vegetation. Around the patch perimeter, trees are showing symptoms of severe stress and decline. We examined dead and live trees within the burn, around the perimeter, and outside the patch to find possible causes. Tree roots examined had no signs of disease, but did show signs of improper growth ("J" rooting). Tom mentioned that past plantings used the "slit" method, which could explain some of the root bending. Stumps within the mortality pocket were examined for signs of annosus root disease (*Heterobasidion annosum*) but none was found. Insects identified on pines were minor foliage and stem feeders (defoliating weevils and Pine shoot borer); while unsightly, these insects could not have caused the unexplained mortality.

One tree was found to have wood-boring galleries, yet no other trees were found with the same activity. We speculated that the mortality was due to high soil temperatures from geothermal activity.

Central Rock Creek Thin

This project is a Forest Health Protection Prevention project that was initiated in Fiscal Year 2005. The project objective was thinning dense areas of pines to suppress and prevent current bark beetle activity. We visited two campgrounds that were included in this project, French Gulch and East Fork. The predominant tree species in these campgrounds were single-leaf pinyon and lodgepole pine, respectively. At French Gulch campground, most of the pine thinning had been completed earlier in the summer; however, some remaining trees had light to heavy infections of dwarf mistletoe. It would be recommended to re-evaluate this area for sanitation removal of heavily infected trees to slow the spread of mistletoe.

At the East Fork campground, understory thinning of small diameter lodgepole, as well as some sanitation removal of larger trees, was still in progress. Scattered patches of mortality associated with mountain pine beetle had occurred in and surrounding areas of the campground for the past few years. Thinning of dense stands and removing weakened trees would improve resource distribution among remaining trees, and alter environmental conditions to those that would be unfavorable for bark beetle attack.

Private Lands

Aspendell (small community up Rock Creek drainage)
A homeowner in Aspendell had five pines in her yard showing unusual branch dieback and needle discoloration (figure 1). Upon examination of the trees and the surrounding area, we noticed that three trees were close to two fire pits or burn piles. Due to the proximity of the trees to the pit, radiant heat probably caused severe needle and branch scorch. Damage was minimal, and the trees will recover despite the one-sided scorching. The other two trees were large, mature pines that were experiencing branch die-back up to a definitive height. Det and John noticed heavy animal chewing on the bark upon closer examination of the dead branches. Det identified limb rust fruiting bodies along dead branches, which he deduced that the animals must have been chewing on and consequently girdled the branches (figure 2).

The fruiting bodies were characteristic of limb rust, *Peridermium spp*. This rust slowly kills branches as it moves upward and outward from the site of infection. Trees gradually weaken as more branches are killed by the rust, which may lead to eventual tree mortality. (See report from Dr. Vogler for more details.)

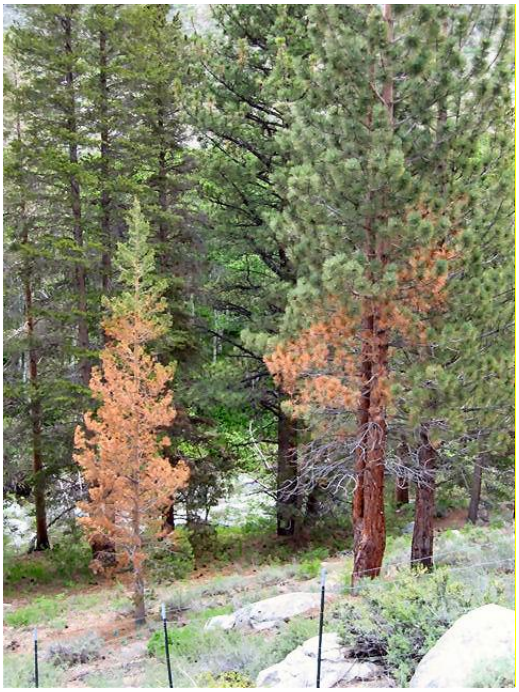

Figure 1. Heat scorch from nearby fire pit.

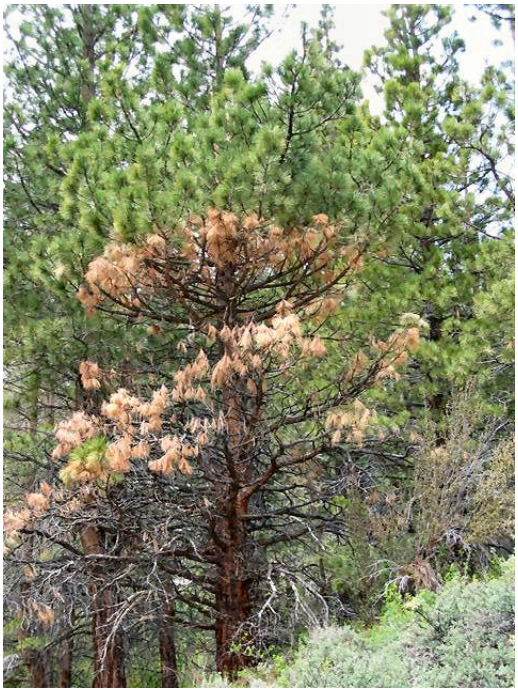

Figure 2. Branch damage from animals.

Sunny Slopes (private holdings on the Mammoth Ranger District)
Two large Jeffrey pines adjacent to a privately owned house in this community were leaning at angles that could be considered hazardous. Both pines and house are situated at the crest of a hill that experiences fairly gusty winds, as evidenced by the one-sided growth of the crown and the direction of tree lean. The pine closest to the house is leaning at a 10-degree angle over the front porch, whereas the other pine situated about twenty feet away, could potentially fall on the detached adjoining garage. Looking at both pines from all aspects and evaluating their root and bole structures, it is difficult to say with certainty if or when either pine will topple. The pines appear healthy: full crowns, good needle retention, large in diameter (>20 inches), sound stem columns and root bases, and no other visible deformity than wind-blown. Tree bases have no indication of soil movement or root disease. No other trees in the surrounding community appeared to have had past failures. Any changes in angle or structure that would indicate tree failure in the near future should be treated as quickly as possible to remove the hazard. Until then, continual monitoring of both trees is recommended.

<u>Caltrans-Crestview Rest Area along CA Highway 395</u>

Scott had noticed some mortality occurring on the highway island divide in front of this rest area north of Mammoth Lakes and asked that we assess it on our return trip. A single pine of about 5 inches in diameter had been infested with pine engraver beetle, *Ips pini*. Probable causes for stress could be its proximity to the road, or its close competition with other pines. No other trees in the island appeared to have been attacked. However, there were several stumps around this tree, indicating past removal. Further north of the pine on the island was a patch of various size pines in a state of decline. The pattern of mortality was characteristic of *H. annosum*. While we did not find signs of the disease in the stumps and seedlings we examined, we did take samples

to further process in the laboratory to see if we can confirm *H. annosum* presence. None of the samples produced microscopic structures of *H. annosum*.

Lee Vining campgrounds along Highway 120

We stopped at several campgrounds (Lower Lee Vining, Cattleguard, Upper Lee Vining I, and Upper Lee Vining II) along this highway at the request of Tom to examine mistletoe infection in the pines. Lodgepole pine dwarf mistletoe, *Arceuthobium americanum*, is infecting both lodgepole and Jeffrey pines in these campgrounds. Infection levels ranged from light to heavy – heavier in the lodgepole trees than Jeffrey. Tree tags on some infected trees indicated to us that the district is aware of which trees are infected and is monitoring them. The Forest is planning to submit a suppression project proposal in FY06 to treat this infestation.

We hope our visits to these sites were helpful. If Scott or Tom have additional questions, or need further assistance, please do not hesitate to contact us.